



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,089	11/20/2003	Stephen P. Cole	BUR920030093US1	1088

30449 7590 04/08/2005  
SCHMEISER, OLSEN + WATTS  
3 LEAR JET LANE  
SUITE 201  
LATHAM, NY 12110

EXAMINER
----------

VU, DAVID

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/707,089

Applicant(s)

COLE ET AL.

Examiner

DAVID VU

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/20/03</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: the following items are not understood: the first bond pad layer 18 has a hardness of *0.8 GPa*; and the aluminum bond pad layer (the second bond pad layer) has a hardness of *0.6 GPa* {See Specification; paragraph [0030]}. Note first that hardness has no units and second that the typical hardness of aluminum is 2.75 rather than 0.6GPa.

Appropriate correction is required.

### Claim Objections

2. Claim 1 is objected to because of the following informalities:

In claim 1, lines 6-7, the phrase "Young's Modulous" should be changed to – Young's Modulus --. Also, check the entire specification for the same error.

Appropriate correction of these informalities is required.

### Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 2818

3. Claims 8 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not include sufficient description to allow one of skill in the art to make and use a device “wherein the hardness of the first layer is about 0.8 and the hardness of the second layer is about 0.6”. As described in the specification; paragraph [0030], the first layer comprises a material selected from the group consisting of: TiAl, an aluminum alloy having at least 2% titanium, an aluminum alloy having at least 2% copper, an aluminum alloy having at least 2% silicon, and an aluminum alloy having at least 2% tungsten; and the second layer comprises of a material selected from the group consisting of: aluminum, aluminum-copper alloys, and aluminum-titanium alloys. None of these materials have the hardness of 0.6 or 0.8.

Appropriate correction is required.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2818

4. Claims 1-20 are rejected under 35 U. S. C. 102(b) as being anticipated by Havemann et al. (US Pat. 6,130,156, herein after Havemann).

Regarding claims 1-3, 7-9, 13, 14, 17 and 18, Havemann discloses method of forming a bond pad for use in a wirebond interconnection, comprising: depositing a first layer of copper bond pad 11 on a substrate; and depositing a second layer of aluminum bond pad 13 on the first layer (col. 4, lines 21-23 and fig. 1c), wherein the Young's Modulus of aluminum is about 69GPa, and the copper is about 124Gpa; the hardness of the copper is about 3.0 and the aluminum is about 2.75.

Regarding the limitations "the first layer of the copper bond pad is more resistant to penetration by a probe tip during probe testing than the second layer of the aluminum bond pad"; and "wherein the first layer of the copper bond pad is more resistant to mechanical failure than the second layer of the aluminum bond pad during mechanical testing of a wirebond interconnection formed on the bond pad" (see claims 4, 5, 10, 11, 15 and 16). This is an inherent property of copper and aluminum.

Regarding claims 6, 12 and 20, Havemann discloses that forming a wirebond interconnection on the bond pad (col. 4, lines 23-25).

Regarding claim 19, Havemann discloses that an oxide layer over a surface of the substrate; and a via formed within the oxide layer within which the first and second layers of the bond pad are formed (col. 3, lines 57-61).

### **Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

March 23, 2005.